

What Works Clearinghouse



June 2012

WWC Review of the Report “Enhancing the Effectiveness of Special Education Programming for Children with Attention Deficit Hyperactivity Disorder Using a Daily Report Card”¹

The findings from this review do not reflect the full body of research evidence on *daily report cards*.

What is this study about?

This study examined whether the use of *daily report cards* (DRCs) in elementary school classrooms improved behavior and academic achievement among students diagnosed with combined inattentive and hyperactive/impulsive attention deficit hyperactivity disorder (ADHD) and comorbid oppositional defiant disorder (ODD)/conduct disorder.

Students with an Individualized Education Program (IEP) in grades 1–6 were recruited for the study and tested for ADHD to determine eligibility. Following an intake process that determined diagnosis and eligibility, a total of 63 students, each with a unique teacher, were randomly assigned either to the intervention condition ($n = 33$) or to the comparison condition ($n = 30$).

The study assessed the effectiveness of DRCs by comparing behavioral and academic outcomes for the intervention and comparison groups at the conclusion of the academic year.

WWC Rating

The research described in this report meets WWC evidence standards without reservations

Strengths: This study is a well-implemented randomized controlled trial.

Features of Daily Report Cards

A *daily report card* (DRC) is a list of target behaviors and overall behavioral goals that are aligned with a child's Individualized Education Program and can be documented by a teacher on a daily basis.

Teachers use the DRCs to provide constant feedback to students during class and then send the DRCs home to parents at the end of each day. Parents are asked to provide rewards or negative sanctions to students at home based on the student's DRC performance.

What did the study find?

At posttest, there were statistically significant positive differences between the intervention and comparison groups on three of the four measures in the external behavior domain. The average effect size for the behavior domain was 0.35.

The study found no statistically significant or substantively important differences in two other domains: (1) reading achievement/literacy, and (2) math achievement.

Appendix A: Study details

Fabiano, G. A., Vujnovic, R. K., Pelham, W. E., Waschbusch, D. A., Massetti, G. M., Pariseau, M. E., ... Volker, M. (2010). Enhancing the effectiveness of special education programming for children with attention deficit hyperactivity disorder using a daily report card. *School Psychology Review, 39*(2), 219–239.

Setting	This study was conducted in 63 first- through sixth-grade classrooms in public elementary schools. The location and number of schools were not reported.
Study sample	Students with an Individualized Education Program (IEP) in grades 1–6 were recruited for the study through mailings, advertisements, and referrals. The eligibility of each student (presence of attention deficit hyperactivity disorder [ADHD], along with average intelligence and achievement levels) was determined using parent and teacher rating scales and student tests. Of the 63 students who met eligibility criteria, 33 were randomly assigned to the intervention condition and 30 to the comparison condition. The majority of students in the sample were White (79%), male (86%), and diagnosed with combined inattentive and hyperactive/impulsive ADHD (87%) and comorbid oppositional defiant disorder (ODD)/conduct disorder (88%). About half (46%) of the students in the intervention group and 60% of students in the comparison group were receiving medication for emotional and behavioral concerns. Examination of demographic characteristics showed no significant differences between the intervention and comparison groups. Analysis sample sizes varied for each outcome, with the intervention group ranging from 30 to 32 students and the comparison group ranging from 25 to 28 students.
Intervention group	School psychology graduate student consultants were assigned to work with each family and teacher for the entire school year. Consultants and teachers developed a unique <i>daily report card (DRC)</i> for each student, using the student's IEP goals as a starting point. Teachers provided students with immediate feedback regarding their targeted behaviors and sent the <i>DRCs</i> home to parents at the end of each implementation day. Parents were asked to provide or revoke privileges on the basis of the students' performance. The <i>DRC</i> was also discussed at monthly teacher-consultant meetings, and <i>DRC</i> targets were adjusted, if necessary. On average, teachers completed 73% of <i>DRCs</i> , and parents returned 64% of <i>DRCs</i> with a signature.
Comparison group	School psychology graduate student consultants were assigned to work with each family and teacher for the entire school year. Consultants and teachers developed an individualized target behavior evaluation (ITBE) for each student using the IEP as a starting point. The ITBE was completed each day by the teacher and was modified on the basis of the student's behavior. No daily feedback was given to the student, and the document was not sent home to parents each day. Teachers were not instructed to give their students feedback, but instead were instructed to work with the participating student as they would with their other students with IEPs. Parents were contacted monthly about their child's behavior. On average, teachers completed 77% of ITBEs.

Outcomes and measurement	Student outcomes were measured in the external behavior domain using an academic productivity scale, the average frequency of classroom rule violations, and the Disruptive Behavior Disorder (DBD) rating scales for ADHD and ODD. Student outcomes in reading achievement/literacy and math achievement were also measured using the Woodcock-Johnson III Tests of Achievement (WJ III). For a more detailed description of these outcome measures, see Appendix B.
Support for implementation	The study also provided outcome data from the productivity subscale of the Academic Performance Rating Scale (APRS), the Impairment Rating Scale (IRS), and teachers' ratings of IEP goal improvement; these measures were not included in the WWC review because other measures provided more direct, objective assessments of these outcomes. Student-teacher relationships and teacher/parent satisfaction were also measured but are not eligible for review under the WWC's Children Classified as Having an Emotional Disturbance review protocol.
Reason for review	Teachers attended three meetings with the study staff to develop and refine the <i>DRCs</i> and to discuss the home rewards. Throughout the year, consultants met with teachers monthly to review student performance and adjust <i>DRC</i> goals, as appropriate. Parents also attended three meetings to introduce them to the study, determine a menu and hierarchy of home-based rewards, and help them plan for nightly homework. Careful maintenance procedures were put in place by the study to ensure that consistent implementation occurred throughout the school year.

Appendix B: Outcome measures for each domain

External behavior	
<i>Academic Performance Rating Scale (APRS): Academic Productivity subscale</i>	The Academic Productivity subscale consists of seven items relating to work completion and accuracy, independent work, and following directions. The subscale has high internal consistency ($\alpha = 0.94$) and test-retest reliability over two weeks ($\alpha = 0.93$).
<i>Classroom rule violations</i>	Classroom rule violations were measured by the average frequency count of a student's classroom rule violations as observed by undergraduate observers in three 30-minute classroom observations at baseline and posttest. Seven positive behaviors were identified, and rule violations were added for each observation. The inter-rater reliability was 0.94, on the basis of two coders jointly observing classrooms on 28% of observation days.
<i>Disruptive Behavior Disorder (DBD) rating scale: ADHD symptoms</i>	Teachers completed the ADHD subscale of the DBD, which measures symptoms using 18 items that reflect the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) symptoms of ADHD.
<i>DBD rating scale: ODD/CD symptoms</i>	Teachers completed the ODD/CD subscale of the DBD, which measures symptoms using 14 items that reflect the DSM-IV symptoms of ODD and CD.
Math achievement	
<i>Woodcock-Johnson III Tests of Achievement (WJ III): Broad Mathematics cluster</i>	The Broad Mathematics cluster of the WJ III is a standardized test consisting of Calculation, Math Fluency, and Applied Problems subtests. The test was administered to all students at pretest and posttest. The subtest's internal consistency reliability across ages is 0.95.
Reading achievement/literacy	
<i>WJ III: Basic Reading Skills cluster</i>	The Basic Reading Skills cluster of the WJ III is a standardized test consisting of Letter-Word Identification and Word Attack subtests. The test was administered to all students at pretest and posttest. The subtest's internal consistency reliability across ages is 0.95.

Appendix C: Study findings for each domain

Domain and outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations				<i>p</i> -value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index		
External behavior									
APRs: Academic productivity subscale	Grades 1–6	58 students	40.94 (6.25)	39.38 (6.73)	1.56	0.55	+21	0.02	
Classroom rule violations	Grades 1–6	60 students	5.11 (23.20)	12.02 (13.41)	6.91	0.20	+8	0.00	
DBD rating scale: ADHD symptoms	Grades 1–6	57 students	1.11 (0.65)	1.23 (0.65)	0.12	0.20	+8	0.39	
DBD rating scale: ODD/CD symptoms	Grades 1–6	58 students	0.54 (0.53)	0.81 (0.79)	0.27	0.43	+17	0.02	
Domain average for external behavior							0.35	+14	Statistically significant
Math achievement									
WJ III: Broad Mathematics cluster	Grades 1–6	55 students	97.24 (14.97)	95.63 (16.66)	1.61	0.08	+3	0.61	
Domain average for math achievement							0.08	+3	Not statistically significant
Reading achievement/literacy									
WJ III: Basic Reading Skills cluster	Grades 1–6	55 students	96.84 (13.17)	94.37 (18.56)	2.47	0.02	+1	0.87	
Domain average for reading achievement/literacy							0.02	+1	Not statistically significant

Table Notes: Positive results for mean difference, effect size, and improvement index favor the intervention group; negative results favor the comparison group. For the average observed frequency count of *classroom rule violations*, *Disruptive Behavior Disorder (DBD) rating scale: ADHD symptoms*, and *DBD rating scale: ODD/CD symptoms*, signs were reversed on the mean difference to demonstrate that the intervention group was favored when negative differences were reported. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the change (measured in standard deviations) in an average student's outcome that can be expected if the student is given the intervention. The improvement index is an alternate presentation of the effect size, reflecting the change in an average student's percentile rank that can be expected if the student is given the intervention. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study's domain average was determined by the WWC; for the external behavior domain, the study is characterized as having a statistically significant positive effect because univariate statistical tests are reported for each outcome measure, the effect for at least one measure within the domain is positive and statistically significant, and no effects are negative and statistically significant. The study's effect within the math achievement and reading achievement/literacy domains is characterized as not statistically significant because univariate statistical tests are reported for each outcome measure and each of the effects within the domains are not statistically significant. APRS = Academic Performance Rating Scale. WJ III = Woodcock-Johnson III Tests of Achievement.

Study Notes: The effects on *classroom rule violations* were analyzed using a hierarchical linear modeling approach that included the assessment points (baseline and end points) as a within-subjects factor. The effects on all other outcomes reported here were analyzed using analysis of covariance (ANCOVA), with baseline achievement scores entered as a covariate. The WWC calculated the intervention group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the WWC Handbook for more information. The *p*-values presented here were reported in the original study. A correction for multiple comparisons was needed for the external behavior domain but did not affect significance levels. No corrections for clustering were needed. Sample sizes for each outcome were provided by the author in response to a request by the WWC.

Endnotes

¹ Single-study reviews examine evidence published in a study (supplemented, if necessary, by information obtained directly from the author[s]) to assess whether the study design meets WWC evidence standards. The review reports the WWC's assessment of whether the study meets WWC evidence standards and summarizes the study findings following WWC conventions for reporting evidence on effectiveness. The WWC rating applies only to the summarized results, and not necessarily to all results presented in the study. This study was reviewed using the Children Classified as Having an Emotional Disturbance review protocol.

Recommended Citation

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2012, June). *WWC review of the report: Enhancing the effectiveness of special education programming for children with attention deficit hyperactivity disorder using a daily report card*. Retrieved from <http://whatworks.ed.gov>.

Glossary of Terms

Attrition	Attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study.
Clustering adjustment	If intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
Confounding factor	A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
Design	The design of a study is the method by which intervention and comparison groups were assigned.
Domain	A domain is a group of closely related outcomes.
Effect size	The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across studies and outcomes.
Eligibility	A study is eligible for review and inclusion in this report if it falls within the scope of the review protocol and uses either an experimental or matched comparison group design.
Equivalence	A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
Improvement index	Along a percentile distribution of students, the improvement index represents the gain or loss of the average student due to the intervention. As the average student starts at the 50th percentile, the measure ranges from -50 to +50.
Multiple comparison adjustment	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
Quasi-experimental design (QED)	A quasi-experimental design (QED) is a research design in which subjects are assigned to intervention and comparison groups through a process that is not random.
Randomized controlled trial (RCT)	A randomized controlled trial (RCT) is an experiment in which investigators randomly assign eligible participants into intervention and comparison groups.
Single-case design (SCD)	A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.
Standard deviation	The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample tend to be spread out over a large range of values.
Statistical significance	Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ($p < 0.05$).
Substantively important	A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.

Please see the WWC Procedures and Standards Handbook (version 2.1) for additional details.